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10/522,350	10/20/2005	Li Jiang	57.0478 US PCT	6318
37003	7590	02/26/2009	EXAMINER	
SCHLUMBERGER-DOLL RESEARCH			SASAKI, SHOGO	
ATTN: INTELLECTUAL PROPERTY LAW DEPARTMENT			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/522,350	<b>Applicant(s)</b> JIANG ET AL.
	<b>Examiner</b> Shogo Sasaki	<b>Art Unit</b> 1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 03 February 2009.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-4 and 6-32 is/are pending in the application.  
 4a) Of the above claim(s) 14, 16 and 18-24 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-4, 6-13, 15, 17 and 25-32 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 24 January 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 2/3/2009.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

**DETAILED ACTION**

1. Amendments to the specification; and cancellation of claim 5 are acknowledged.

***Response to Arguments***

2. Applicant's arguments filed on 2/3/2009 have been fully considered but they are not persuasive. The online availability establishes the printed publication date, since the prior art was available in electronically printed form. Also, the online available date is the date that the material became available for the public use.

The inventive entities of instant application differ from the authorship of Sensors and Actuators B: Chemical, 2002, 87, 33-40. However the rejection was base on 102(b).

Applicant did not submit an argument pointing out disagreements with the examiner's contentions. Applicant also did not discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them. Therefore the rejection in this office action is FINAL.

***Information Disclosure Statement***

3. The information disclosure statement filed on 2/3/2009 includes a reference (Sensors and Actuators B: Chemical, 2002, 87, 33-40) has been already cited in the first office action and it is on the record.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant stated in the reply that these claims are now amended, however these claims are submitted in the previously presented form. There are no changes made to these claims.

Regarding claim 12, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d). Appropriate correction is needed.

Claim 13 recites the limitation "the wellbore fluid" in line 3. There is insufficient antecedent basis for this limitation in the claim. It is suggested to replace "the wellbore fluid" with "a wellbore fluid," or define to define the limitation earlier in the claim.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-4, 6-8, 12, 15, 17 and 25-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Thompson et al. (A reagentless renewable N,N'-diphenyl-p-phenylenediamine loaded sensor for hydrogen sulfide).

Regarding claims 1-4, 6-8, 12, 15, 17 and 25-32, Thompson et al. disclose an electrochemical sensor for measuring the amount of hydrogen sulphide or thiols in a fluid, the sensor comprising:

- containment means which is adapted to receive the hydrogen sulphide or thiols from the fluid (Since the devise described has a field application, the housing for said device containing multiple parts will have to be provided to ensure that the reaction/detection site is free of other environmental factors. Also the sensor disclosed must inherently be enclosed for the containment of samples and reagents.) and which contains a precursor (abstract, DPPD) and a reaction solution (abstract, aqueous solution of ph 1-7) which together with the hydrogen

sulphide or thiols create a redox reaction resulting in an electrical current dependent upon the amount of hydrogen sulphide or thiols in said fluid (abstract).

- wherein the containment means comprises an electrically conductive porous member (P34/2.1.1., carbon-epoxy electrode) in which said precursor (P35/3.1.; and P38/C2/L1-3, DPPD) and said reaction solution are dispersed (P37/C1/L6-7, L13-16, P38/C2/L23-27: The reaction at the porous electrode is carried out in/with the reaction solution);
- wherein the porous member is moulded from a mixture of the precursor and a suitable binder all in powder form (P34/2.1.1., L5-6, Durcisseur MA2 as the binder, which is the same binder disclosed in applicant's specification; and P38/C2/L1-3, DPPD in solid form), and the reaction solution is dispersed in the pores of the porous member (P37/C1/L6-7, L13-16, P38/C2/L23-27: The reaction at the porous electrode is carried out in/with the reaction solution);
- wherein the precursor is selected from N,N'-diphenyl-1,4-phenylenediamine, N,N'dimethylphenyl-1,4-diamine, catechol and dopamine (abstract);
- wherein the binder is an epoxy resin (P34/2.1.1./L6);
- wherein the mixture further includes a powder conductivity agent (P34/2.1.1., L5);
- wherein the powder conductivity agent is selected from metal powder and carbon powder (P34/2.1.1., L5);
- wherein the binder, the precursor and the conductivity agent are mixed in proportions of about 1:1.4:1.6 by weight (P39/C1/L3);
- wherein the reaction solution is an acidic solution such as dilute hydrochloric acid (P37/C1/L6-7, L13-16; and P38/C2/L23-27);
- means for measuring said current (P34/C2/L26-29);

Regarding limitations recited in claims 28-32 which are directed to a manner of operating disclosed sensor, it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and

2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 9, 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (A reagentless renewable N,N'-diphenyl-p-phenylenediamine

loaded sensor for hydrogen sulfide), as applied to claim 1 above, in view of Madou et al. (EP 299779).

Regarding claim 9, 10 and 13, Thompson et al. discloses all of the limitations as set forth above.

Thompson et al. do not disclose:

- wherein the reaction solution includes a gelling agent;
- wherein the gelling agent is a crosslinked water-soluble polymer; and
- wherein a permeable membrane provided on one face of the porous member.

Madou et al. disclose an electrochemical gas sensor which may be used to detect hydrogen sulfide (Abstract; and C9/L3). The device includes: (a) a substrate (12) having a surface (14) having an opening: (b) a gas and vapor permeable sensing electrode (20) located across the opening; and (c) an electrolytic medium (26) in contact with the electrode (Fig 1-5). The electrolytic medium (26) may be a hydrogel (C3/L41-42) such as polyacrylamide gel (C4/L14). A filter material (Figs. 1 and 5, 38) may be placed in the passage between the second surface of the substrate and the porous member (Fig. 1 and 5, 30; and C7/L3-6). The filter material may be a gas permeable membrane (C7/L15-19).

Thompson et al. and Madou et al. are combinable because they are concerned with the same field of endeavor, namely gas detection via electrochemical reaction.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Thompson et al. and replace reaction/electrolyte solution with the reaction/electrolyte gel as taught by Madou et al., for the purpose of electrically isolating the electrochemical reaction site.

It would also have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Thompson et al. to incorporate a gas permeable filtering device as taught by Madou et al., for the purpose of eliminating debris from entering the sensor, while permitting gasses of interest to enter the sensor.

Regarding the limitation "the porous member is adapted to receive the hydrogen sulphide or thiols from the wellbore fluid" recited in claim 13, which are directed to a

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manner of operating disclosed sensor, it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim.

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (A reagentless renewable N,N'-diphenyl-p-phenylenediamine loaded sensor for hydrogen sulfide) in view of Madou et al. (EP 299779), as applied to claims 1, 9 and 10 above, and further in view of Anderson et al. (US 2001/0015320).

Regarding claim 11, modified Thompson et al. disclose all of the limitations as set forth above. Modified Thompson et al. further disclose the use of polyacrylamide gel for entrapping electrolytes (C3/L41-42; and C4/L14).

Modified Thompson et al. do not disclose wherein a cross-linking agent selected from formaldehyde and N,N'-methylenebisacrylamide.

Anderson et al. teaches that N,N'-methylenebisacrylamide is typically used as crosslinker for polyacrylamide gels (Paragraph [0020]).

Modified Thompson et al. and Anderson et al. are combinable because they are concerned with the same field of endeavor, namely use of polyacrylamide gel for the entrapment of chemical agents.

It would have been obvious to one having ordinary skill in the art at the time of the invention to use N,N'-methylenebisacrylamide as the crosslinker as taught by Anderson et al., since it was within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use, and the combination have yielded the predictable result.

### ***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shogo Sasaki whose telephone number is (571)270-7071. The examiner can normally be reached on Mon-Thur, 10:00am-6:30pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS  
2/12/09  
/Brian R Gordon/  
Primary Examiner, Art Unit 1797